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Short Communication

Utilization of *Terminalia ivorensis* A.Chev. a threatened tree species in Nigeria and the implication on its risk of extinction

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Abstract. Plant resource utilization is one ecological force promoting extinction risk in the plant kingdom. Many plant species have been wiped off the globe due to this factor. This is what makes studying human perception in relation to utilization of biological resources very important especially the threatened species. This study considers a threatened tree species, *Terminalia ivorensis*, that is found in Nigeria. Local people from a small locality within the southwest region of Nigeria were interviewed in this study. This study revealed a wide range of uses for which this species is collected in the wild. This implies the local people are very familiar with this plant species to be collected for different purposes. Most of the parts of this plant species are used for one purpose or another. This study concludes that continuous indiscriminate collection of this species will keep the wild population declining and aggravate the risk of extinction. It is recommended that the local people be sensitized on the sustainable utilization of this species, and government regulation that discourages indiscriminate harvest of this species should be enacted.

Keywords: Biodiversity loss, conservation, ethnobotany, threats, extinction risk.

INTRODUCTION

Ecosystem disruption, which is currently due to explosive biodiversity loss, keeps creating a natural imbalance that creates an unhealthy biosphere (Rawtani et al. 2022; Soanes et al. 2023). Many ecosystem services, directly or indirectly, have been affected by this extinction crisis, and this will further subject the world to environmental hazards and bio-resource scarcity in the future (Knapp et al. 2020). Plant taxa have been projected to keep declining due to many factors ranging from climate change, invasive species spread, and aggressive craving for plant materials to meet unending human demands (Cowie et al. 2022). Different geographical regions in the world are experiencing different unique kind of patterns in this plant extinction episode hence geographical distribution needs to be put into serious consideration in studying the current plant species decline (Crain et al. 2015).

Trees are important parts of ecosystems, and they are given much attention and consideration due to their social and scientific interest in relation to their ecosystem services (Beech et al. 2017). Trees provide many ecological supports to functioning ecosystems, which include support for arboreal life, soil development, and support for other plant life forms (Pinho et al. 2020). They are also relevant in meeting the economic and social needs of humans in maintaining a balanced environment, providing recreation in places such as parks and serving as source of food, medicine, woods and timbers (Mori et al. 2017). In recent times there have been much reliance on plant resources due to explosive human population growth (Mukwevho 2014). This has aggravated decline of plant species in recent decades (Barata et al. 2016). But the majority

of these plants threatened with extinction are trees (Beech et al. 2017). Close to half of the global tree species already assessed by conservation authorities globally are facing extinction risk Mark et al. 2014; Beech et al. 2017).

Continuous evaluation of tree taxa is necessary to keep track of the species that are becoming more highly vulnerable to extinction and hence designing plans, methods, and initiatives to salvage the extirpation of these species (Liu et al. 2019). Factors causing extinction risk keep changing with time in different regions, and there is a pattern of species specificity concerning factors promoting extinction risk in the flora kingdom (Bamigboye et al. 2016). In this continuous evaluation of tree extinction risk, the human perspective must be integrated to determine the extent of utilization and sustainability and determine how this intertwines with tree species' risk of extinction.

Terminalia ivorensis A.Chev. is a globally threatened tree species, and this species is found in Nigeria (Borokinin 2014). A thorough ethnobotanical study of this species and how its utilization might increase the risk of extinction is an important study that should be conducted. In this study, an ethnobotanical survey of this threatened species was conducted in Ijebu lgbo, which is a community in Ogun State within the Southwest region of Nigeria.

This study was conducted to determine human local utilization of *Terminalia ivorensis* that might increase the risk of extinction of this threatened tree species.

MATERIALS AND METHODS

Study area

Ijebu Igbo is a small town in Ogun State in South-western part of Nigeria (Figure 1). It is a region characterized by high deciduous rainforest. There are many species of trees, shrubs and herbs in this area that the local people collect for many uses. This community is made up of Yoruba speaking people.

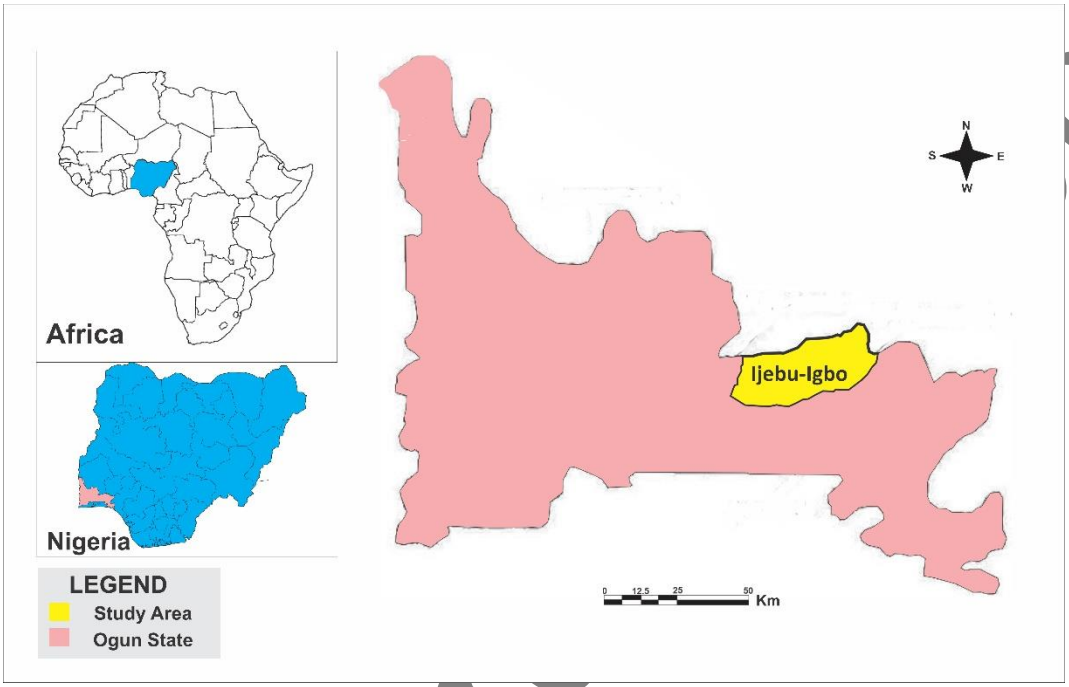

Figure 1. Map showing the study area surveyed in this study.

In this study 50 people were interviewed in a small community called Ijebu Igbo in Ogun State Nigeria. Ijebu Igbo is a small town in Ogun State in South-western part of Nigeria. It is a region characterised by high deciduous rainforest with high level of rainfall. This community is made up of Yoruba speaking people. Semi structured questionnaires were administered in this study to determine different uses of *Terminalia ivorensis* in this area. Demographic information of the respondents was collected and their knowledge on the uses of the plants was documented.

The survey was conducted in Yoruba language which is the native language of the people in the areas where the interviews were conducted. A prior consent on demanding information for research purpose alone was sought from each respondent in order to be able to clarify that any information they supply is not meant for commercial purposes but for research purpose alone. The parts of the plant that are used for various purposes as given by the respondents was documented. Different uses of the plants that the respondents have a knowledge of was documented. The respondents were also asked if they are aware of any law regulating harvest of *Terminalia ivorensis*.

RESULTS

Terminalia ivorensis was identified by the people interviewed through the local name. The local name of this plant species in the local language of this region is Afaradudu. All the respondents identified this plant species through this local name. This shows the importance of indigenous knowledge in biodiversity conservation. In the survey result, 64% of the respondents were males, while 36% were females. It was discovered that the most mentioned use by the respondents is medicinal uses, followed by use for wood production (Figure 2). The most mentioned part being used is the bark, followed by the stem. All the respondents said they are not aware of any law that prohibits or regulates the harvest of *Terminalia ivorensis*.

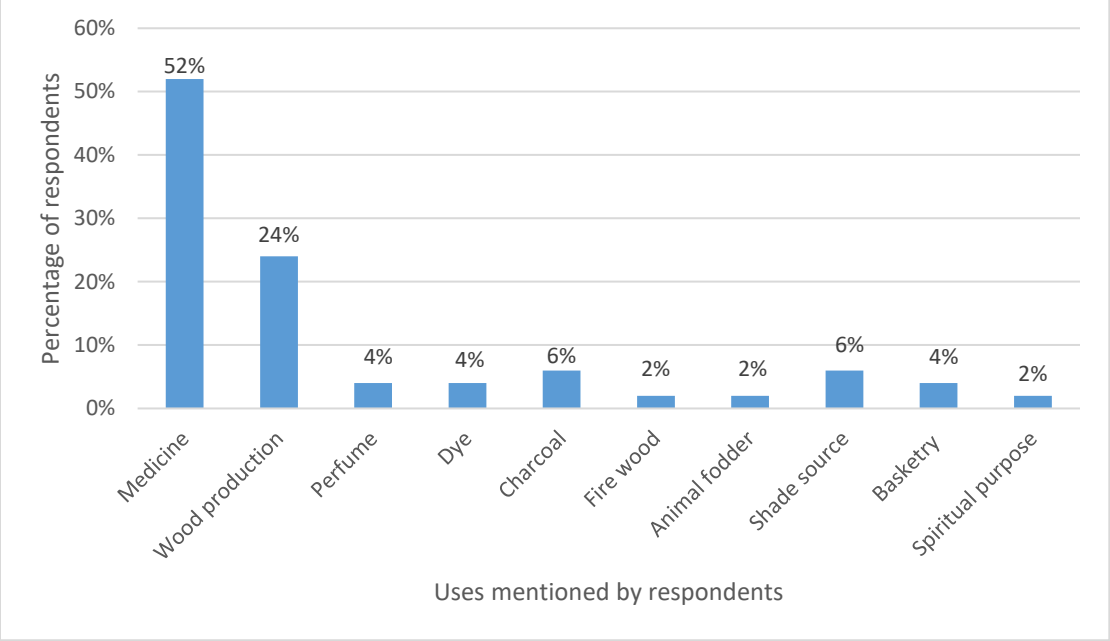

Figure 2. Uses of *Terminalia ivorensis* mentioned by respondents.

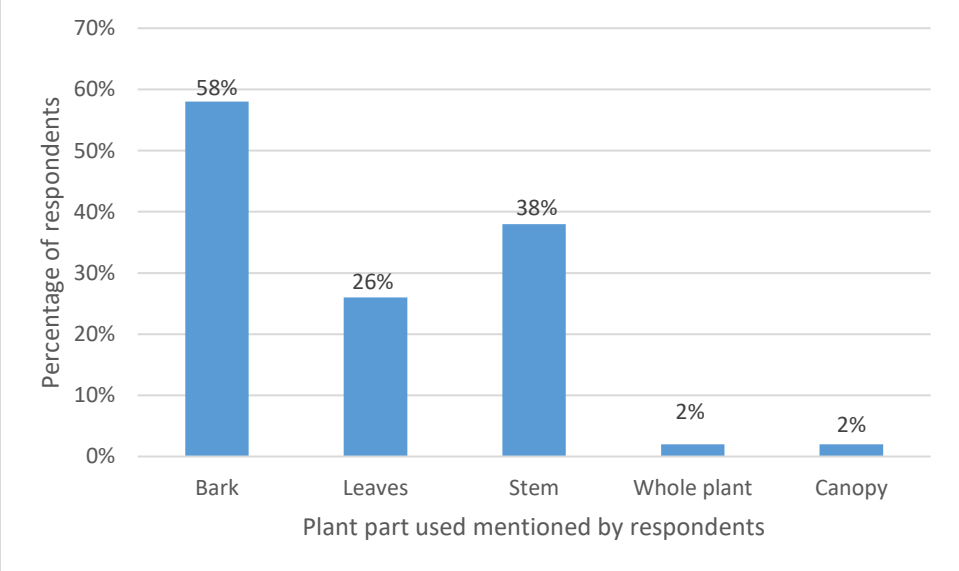

Figure 3. Parts of *Terminalia ivorensis* for different uses mentioned by respondents.

DISCUSSION

Traditional knowledge is highly essential in identifying the level of threats to tree taxa that is posed by excessive utilization of these species to meet human needs (Bamigboye et al. 2017: Agbani et al. 2018). The perception of the local people can assist in unravelling patterns of extinction risk in threatened species due to anthropogenic pressure (Ndou et al. 2021). This study through the indigenous knowledge revealed *Terminalia ivorensis* is in high demand to meet several needs (Figure 2).

Harvesting plants for traditional medicine threatens the survival of several plant species (Williams et al. 2013; Barata et al. 2016; Hilonga et al. 2019). This is because most of the harvest is done indiscriminately during harvest for traditional medicine. The potential of the plants to recover from the practice is not considered when there is a high demand for certain species for traditional medicine. Some highly threatened plant genera have become more vulnerable to extinction because of this practice, and some are already extinct due to craving for them to satisfy demands for traditional medicine (Williams et al. 2013; Van Wyk and Prinsloo 2018; Bamigboye and Tshisikhawe 2020). This study has identified harvest for traditional medicine as a major threat to *Terminalia ivorensis* (Figure 2) and the continuous collection of *Terminalia ivorensis* for medicinal purposes might further increase the risk of extinction.

Bark harvesting of threatened species keeps promoting the decline of the species in the wild because it reduces the reproductive capacity of tree taxa (Mohammed et al. 2022)) and continuous bark harvesting of threatened species will always increase the risk of extinction of the species

(Tiawoun et al. 2019; Bamigboye and Tshisikhawe 2020). The result of this study showed that the practice of bark harvest of *Terminalia ivorensis* is a common practice in the community where this interview was conducted (Figure 3). This practice will keep declining the population of this species in the wild.

Continuous chopping down of the stem of trees for timber and wood production has been one of the main threats to the survival of threatened trees in Africa (Corlet 2020). This practice wipes off populations of tree taxa within short span of time. This is also a practice that was detected to be common practice in the community where this study was conducted (Figure 3). With continuity of this practice, this species will still face higher risk of extinction in future.

Harvest of leaves was detected in this study (Figure 3). Although this practice might seem not too harmful but when density of leaf harvest is very high in threatened species, it might still affect their regeneration potential (Guilherme et al. 2015) hence resulting into decline of populations due to reproductive failure.

CONCLUSION

Although *Terminalia ivorensis* is a globally threatened tree (Borokini 2014), this study revealed lack of regulation of the harvest of this species in Nigeria. The unsustainable utilization of this species for various uses detected in this study (Figure 1 and 2) will keep declining the population of this species in the wild. Awareness at community level on the need of sustainable utilization of this species is needed and certain laws that will restrict indiscriminate harvest of this tree species should also be encouraged in Nigeria.

Conflict of interest

No conflict of interest declared by the authors.

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